Research Article

Cross-sectional study of visual and musculoskeletal disorders among the information technology professional workers in Bengaluru South, Karnataka, India

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ABSTRACT

Background: India has been in the forefront in cyber world with information technology (IT) industry developing into a major service provider. Computers are the vital tool used by these IT professionals. However, the long periods of working at a computer as most people do, can cause musculoskeletal problems, eyestrain, and overuse injuries of the hands and wrists which can be reduced or eliminated with proper workstation design and improved posture. With younger generation being introduced to computers much early on in life, it is all the more important to be aware of the problems and follow necessary preventive steps to check the progression of computer related health problems.

Methods: It is a cross-sectional descriptive study, conducted among the IT professionals working in IT companies of Bengaluru South zone. Based on a previous study, with musculoskeletal disorder 77.5%, 10% allowable error, sample size calculated as 120. Study was conducted during August 2015- November 2015.

Results: Most of the respondents, 90.83% (109) worked on computer for 7-9 hours. Visual symptoms present in 94/120 (78.33%) of the respondents in past 6 months. Musculoskeletal symptoms present in 84/120 (70%) of respondents. Most of them, 80 (66.66%) were not trained regarding appropriate posture while working on computer.

Conclusions: IT professional are of younger age and are prone to early health disorders due to long continuous working hours on computer. Majority of them are not trained in any kind of appropriate posture for working on computer.

Keywords: IT professionals, Work related health disorders, Computer

INTRODUCTION

India has been in the forefront in cyber world with information technology (IT) industry developing into a major service provider.¹ A lot of job opportunities are provided in this field and the younger generation is attracted to this both for the earning and enjoyment.² Computers are the vital tool used by these IT professionals. Computers are utilized by 56% of people at occupational level and 62% at personal level.³ They have made the work easier than working with pen and paper. However, the long periods of working at a computer as

most people do, can cause musculoskeletal problems, eyestrain, and overuse injuries of the hands and wrists which can be reduced or eliminated with proper workstation design and improved posture.⁴

The disorders are said to be work-related when the work environment and performance of work are significant contributors to their development or exacerbation, but are not the sole determinant of causation.⁵ Disorder is work-related when work procedures, equipment, or environment contribute significantly to the cause of the disorder (WHO, 1985). Musculoskeletal disorders are

like pain and stiffness in neck, shoulder, wrist, lower back and also lower limbs and visual disorders like watering, irritation, blurring, dryness, headache etc.

Long working hours, static postures, poor office ergonomics, and repetitive nature of work were identified as some of the risk factors leading to pain and discomfort.⁶ Using the wrong chair or just sitting improperly in front of a computer for long time can lead to chronic debilities such as stiffness, headache, and backache.¹ Muscles and tendons can become inflamed due to greater periods of sitting on computers. Carpal tunnel syndrome is a common example of an overuse injury associated with computer work.⁴

Most studies indicate that visual symptoms are more common among people working on computer. The human eye basically prefers to look at the objects greater than 6 m away, thus work done on computer demands a close-up view which strains eye muscles and thereby leads to eye fatigue.⁴

These problems if ignored can become chronic and lead to debilitating conditions in future. Hence, there is an urgent need to focus on reducing the occurrence of these disorders by following simple steps at working environment. With younger generation being introduced to computers much early on in life, it is all the more important to be aware of the problems and follow necessary preventive steps to check the progression of computer related health problems.⁷

These disorders can be reduced/eliminated by proper working environment, well-designed work- station and following proper postures while working.

Objectives

- To study the proportion of visual and musculoskeletal disorders among the IT professionals in Bengaluru South zone.
- To determine the factors affecting and their relationship with the disorders
- To study the measures undertaken to overcome the disorders.

METHODS

A cross-sectional descriptive study was conducted among the randomly selected IT companies in Bengaluru South zone for a period of four months between August to November 2015. Study sample size was estimated as 116 and rounded off to 120 based on a previous study by Sharma A K, et.al.⁸ with 77.5% prevalence of musculoskeletal disorders. IT companies from Bengaluru South zone were chosen by Simple Random Sampling. Sample size was achieved by convenience sampling technique.

Inclusion criteria

- Those in age group of 25-40 years.
- Worked on computers for at least 4 hours/ day or 20 hours/ week.
- Are in the same job since 6 months.

Exclusion criteria

- Those working in night-shifts.

Data collection was started after obtaining clearance from the Institution Ethical Committee. Permission was obtained from the Managing Director of the IT companies. Informed consent for the study was obtained from the working IT professionals. Pre-tested, semi-structured, self-administered questionnaire was used to collect information regarding their disorders, factors affecting and measures undertaken by the subjects. Confidentiality was maintained. Data was entered in Microsoft excel sheet and analysed using SPSS 21 software. Descriptive statistics such as frequency tables, pie diagrams and bar charts were used wherever necessary.

RESULTS

Among 120 respondents majority 96 (80%) were males and remaining 24 (20%) were females. Most of them belonged to Hindu religion. 62.5% (75) were in age group of 26-30 yrs. 33.33% (40) were in 20-25 years. (Figure 1).

Figure 1: Age-wise distribution of the study population in percentage (n=120).

37.5% (45) of them worked for 2-3 years. 38.33% (46) for 4-5 years. Majority of respondents worked in the same company for 2 to 5 years (Table 1).

Most of the respondents, 90.83% (109) worked on computer for 7-9 hours. Few of them worked for more than 10 hours (Figure 2). Mean duration of working on computer was 8.15 ± 2.3 hours. 66.6% worked on personal computer, 12.5% on laptop and 20.8% worked on both.

Table 1: Time duration of working in same company.

Duration	n = 120	Percentage
6 months to 1 year	24	20
2 to 3 years	45	37.5
4 to 5 years	46	38.33
>5 years	5	4.16

When asked about the posture related questions the responses were: Only 10 of them didn't lean back in chair for back support. 74.16% (89) did not work with elbows at 90 degree angle. 34.16% (41) did not place their feet on foot-rest. 35.83% (43) do not sit symmetrically while working. 22.5% (27) did not have monitor at the eye level. 44.16% (53) did not hold wrist in neutral position and did not change sitting position more frequently. 38.33% (46) did not take frequent micro – breaks. Most of them, 66.66% (80) were not trained

regarding appropriate posture while working on computer (Table 2).

Figure 2: Time duration of working on computer (n=120).**Table 2: Respondents not following appropriate posture while working on computer.**

Appropriate posture to be followed	*Not practiced (out of 120 respondents)	Percentage
Lean back in chair to support your back	10	8.33
Elbows at 90 degree angle	89	74.16
Feet comfortable in front on foot-rest	41	34.16
Sit symmetrically (Not tilt to one side)	43	35.83
Key-board and mouse at finger tips	09	7.5
Key-board and mouse are at same level	12	10
Screen at an arm's length from your eyes	13	10.83
Monitor is at level to your eyes	27	22.5
Neutral position of wrist (Straight from fingers to elbows)	53	44.16
Change sitting position frequently (at least every 15 minutes)	53	44.16
Take frequent micro – breaks	46	38.33
Trained in proper posture at work	80	66.66
Take active breaks (not sit in front of computer during break)	22	18.33

*Multiple responses were taken into consideration

Visual symptoms were present in 78.33% (94/120) of the respondents in past 6 months. 32.5% (39) had watering of eyes and pain in the eyes, 27.5% (33) had irritation of eyes, 25.8% (31) had burning / itching in the eyes and 31.66% (38) had headache while working on computer. (Table 3).

Musculoskeletal symptoms were present in 70% (84/120) of respondents. 46.6% (56) of them complained of pain in neck, 26.6% (32) of them in shoulder and 55% (66) of them in the lower back (Table 4).

To overcome these symptoms, 69.16% (83) of the respondents performed self-stretching during work, 50.8% (61) started taking more frequent micro-breaks, 24.16% (29) of them adjusted work-station, 21.66% (26)

on them took pain-killers on their own and 24.16% (29) of them did not do anything about it (Table 5).

Table 3: Visual symptoms in past 6 months.

Visual symptoms	*Present (total = 211)	Percentage
Watering of eyes	39	18.48
Pain in the eyes	39	18.48
Irritation in the eyes	33	15.63
Burning / itching in the eyes	31	14.70
Redness	09	4.26
Headache	38	18.01
Blurring of vision	22	10.42

*Multiple responses were taken into consideration.

Table 4: Musculoskeletal symptoms in past 6 months.

Musculoskeletal symptoms	*Present (total 218)	Percentage
Neck	56	25.69
Shoulder	32	14.68
Elbow	08	3.66
Wrist	18	8.25
Upper back	19	8.72
Lower back	66	30.27
Hips	10	4.59
Knees	09	4.12

*Multiple responses were taken into consideration.

Table 5: Measures undertaken by the individual to overcome the symptoms.

Measures undertaken to reduce symptoms by individual	*Responses (242)	Percentage
Did not do anything	29	24.16
Started taking more frequent breaks	61	50.83
Reduced working hours	03	2.50
Visited doctor	09	7.50
Physiotherapy	02	1.66
Perform self- stretching	83	69.16
Adjusted / modified work station	29	24.16
Took pain killers for symptoms on my own	26	21.66

*Multiple responses were taken into consideration.

Relationship between various appropriate posture factors and symptoms: When responses of screen distance at an arm's length was related with visual symptoms, there was a significant association between the two (p value-0.04). Even though an association was found between other factors like lean back on chair, frequently change sitting position, neutral position of wrist and taking micro-breaks, it was not significant.

When performing self –stretching by the individual was related to musculoskeletal symptoms there was significant association (p value 0.035).

DISCUSSION

Majority of respondents were males, with male to female ratio of 4:1. Most of the respondents (96%) fell in the age group of 20-30 years. Many respondents (75.83%) included in study were working in the same company since 2-5 years. Mean duration of working on computer was 8.15 ± 2.3 hours which was found similar to a study by Sharma AK et al where it was 7.05 ± 1.98 hour.⁸

78.33% had one or other visual symptoms in past 6 months which coincides with the result of 77.5% by Sharma AK et al.⁸ The proportion of respondents with

musculoskeletal symptoms were 70% which is similar to a study by Kauasalya R et al (64.5%).⁶ Watering of eyes and pain in eyes were most common visual symptoms (32.5%) in this study which is in contrast to a study by Shrivastava SR et al where redness of eyes was the common one (40.2%).¹ The major musculoskeletal symptoms were pain in neck (46.66%) and lower back (55%) which is similar to a study by Vijay SA; where pain in the neck and lower back was 30.33% and 25.4% respectively.⁵

There was an association between various factors .When responses of screen distance at an arm's length was related with visual symptoms, there was a significant association between the two (P-0.04). An association was found between other factors like lean back on chair, frequently change sitting position, neutral position of wrist and taking micro-breaks, with symptoms which is similar to study by Kauasalya R et al.⁷

Performing self-stretching was the most commonly adopted measure for reducing musculoskeletal symptoms by respondents (69%) followed by started taking more frequent breaks (50.83%). Significant relationship was found between performing self-stretching and musculoskeletal symptoms (P 0.035).

CONCLUSION

IT professional are of younger age and are prone to early health disorders due to long continuous working hours on computer. In this study visual symptoms were major disorder followed by musculoskeletal. Among that neck and lower back are affected badly. Majority of them are not trained in any kind of appropriate posture.

Association was found between certain factors related to posture and the visual or musculoskeletal symptoms. Most of them get relief from symptoms by performing self-stretching and taking frequent micro-breaks.

Limitation of study

- Not considered type of work on computer. (Application development, repetitive work etc.)
- Only symptoms were asked to subjects; not conducted any kind of clinical examination.

Recommendations

- Need to train all IT professionals regarding appropriate posture at work.
- Modify work station according to need like foot rest, elbow rest, screen distance etc.
- Strategies should be developed to give frequent micro-breaks without affecting productivity much.

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